



# **Final Sampling and Analysis Plan for Roofing Material from Trailers T112A and T112B for Isotopic Analysis**

**RF/RMRS-99-332**



**July 21, 1999**

**ADMIN RECORD**

IA-IA-A-00187

### Administrative Information

**Site:** Rocky Flats Environmental Technology Site  
Golden, Colorado

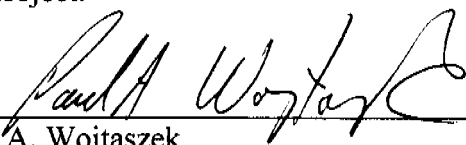
**Project Name:** Sampling of Roofing Material From Trailers T112A and T112B  
for Isotopic Analysis

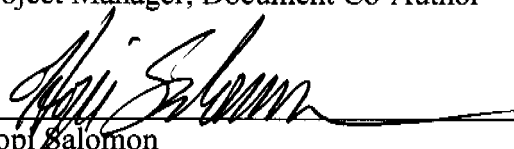
**Date Prepared:** July 20, 1999


**Date Effective:** July 21, 1999

### Approvals


I have read and approved this sampling and analysis plan with respect to the objectives of the project.

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## 1.0 INTRODUCTION

Trailer T112A was assembled at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112, in the early 1960's. The size of the T112A is approximately 45' X 60' and it is assembled from 5 trailer units of approximately 12' X 45' in size. The siding and the skirting (which is approximately 28" high) consists of enamel on aluminum. The trailer is structurally sound. The foundation is concrete blocks and the tie down method for the unit is steel cable from the trailer's I-beam secured to concrete caissons. T112A is unoccupied at the present time, but has previously served as office space for a travel office, transportation security scheduling office, and company store.

Trailer T112B was moved to Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1990 or 1991 from the Bldg. 771 trailer park. At this time the interior was refurbished. T112B has a nearly full length wooden deck with a sloped roof on its south side. The siding and the skirting consists of enamel on aluminum. It has served as a site for folding laundry, telecommunications office space, and storage of telecommunications equipment. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Trailer T112C was put in place at Central Avenue and Fourth Street, behind the northwest corner of Bldg. 112 in 1991. The entryways are covered by wooden panels. The siding and the skirting consists of enamel on aluminum. It has served as office space for the Wackenhut scheduling office. It is presently unoccupied. The tiedown method is unclear due to the intact skirting.

Asbestos characterization data exist for the interior of both trailers, and show asbestos in the floor tile mastic. Hazardous chemicals were not known to be used or stored in these trailers. The trailers have not been characterized for use of lead-based paint.

The purpose of this Sampling and Analysis Plan (SAP) is to collect data to satisfy data gaps regarding radiological contamination of the roofing material of T112A and T112B.

Due to past RFETS experience with the unrestricted release of similar structures it is considered prudent to obtain two media samples each from the roofing material of both T112A and T112B, for a total of four samples. Samples will be taken by the RFETS CAS sample team in accordance with CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*, and section 3.1.1.2 of the Pre-Demolition Survey Plan, excerpted in Section 3.0, *Sample Collection and Analysis*.

## 2.0 DATA QUALITY OBJECTIVES

Decisions must be made as to whether Trailers T112A, T112B, and T112C are radiologically contaminated or eligible for free-release from the site. These decisions will be based on both radiological surveys and radiochemistry samples. This SAP and the DQOs within it only address the radiochemical characterization needs of the project, as radiological surveys shall be covered in a separate characterization package. Further, radiochemistry samples must be collected at the earliest possible time in the project to comply with the project's schedule constraints. Based on visual inspections and historical use of the trailers for administrative purposes only, potential of chemical hazards within or on the trailers has been ruled-out.

### **The Problem**

The quantity and types of radioactivity and radioactive contamination present in and on the trailer are not known with adequate confidence to ensure compliance with free-release criteria; therefore, adequate measurements must be taken to properly characterized the trailers as contaminated or not contaminated. All areas of the trailer shall be characterized through radiological surveys; however, actinides of interest within bulk material on two of the trailer rooftops (Trailers 112A and 112B) must be established through radiochemical analysis because initial radiological surveys (fixed contamination) indicate contamination, but based on site history and process knowledge, naturally-occurring radionuclides (not of DOE origin) are suspected.

### **Identification of Decisions**

What types and quantities of radioactive contamination exist in the bulk matrix of roofing materials, and if present, is contamination above or below free-release levels for the actinides of interest?

### **Inputs to the Decisions**

Inputs to the decision rule include

- radiochemistry results (Pu-239/40, Am-241, U-233/234, U-235, and U-238) from the four samples of interest -- 2 from Trailer 112A and 2 from Trailer 112B,
- quality assurance aspects of the data, including precision, accuracy, representativeness, completeness, and comparability (i.e., the PARCC parameters),
- gross alpha & beta (for DOT shipping limits and compliance),
- unrestricted release criteria (1-P73-HSP-18.10, Appendix 1).

Radiological instrumentation planned for the project is controlled by K-H Analytical Services Division through contractual requirements with onsite and offsite (radiochemistry) vendors. All instrument sensitivities are adequate for producing results comparable to free-release action levels and compliance with DOT requirements.

### **Definition of the Boundaries**

Three-dimensional boundaries for defining the levels and extent of radioactive contamination are given restricted to the Trailer rooftop exteriors referenced above.

There are no temporal boundaries relative to technical data quality; time constraints depend only on project schedule.

#### **Decision Rules**

After conversion of radiochemistry concentrations (from bulk samples) to dpm/100 cm<sup>2</sup>, if the sum-of-ratios of the collective suite of actinides is less than unity (1) for each sample (using the Appendix 1, 1-P73-HSP-18.10 [based on DOE Order 5400.5] free-release level of 100 dpm/100cm<sup>2</sup> in the denominator of each ratio), the associated rooftop contains no DOE-added radiological contamination; otherwise, the rooftop material is contaminated and is considered low-level waste.

The use of this decision rule has precedence through its implementation by radiological engineering on the Building 779 Decommissioning Project, and subsequent approval of the methodology and results by DOE RFFO, CDPHE, and EPA Region VIII.

#### **Limits on Decision Errors**

Based on homogeneity of the bulk material in question, a statistical sampling of the roofs is not necessary, and thus statistical error on the sample set results is not applicable. Random counting errors that are actinide- and sample-specific will be reported with all results, and are typically <10% at elevated levels and <20% at levels near the MDC.

#### **Optimization of the Sampling Design**

If results indicate contamination levels greater than free-release levels, additional samples will be planned to better characterize the trailers in total.

### **3.0 SAMPLE COLLECTION AND ANALYSIS**

T112A is constructed with a tar paper roof that has been painted at some time after installation with a heat reflective paint.

T112B has a heavily oxidized metal roof. Previous surveys of site trailers of similar age and construction have exhibited high alpha count rates due to the deposit of naturally occurring radioactive materials (such as Po-210 or radon daughters) in this porous oxide layer.

For each trailer (T112A and T112B), two locations will be selected by Radiological Engineering based on experience and professional judgement. A minimum of 125 gm is required for each analytical sample, and an additional 125 gm is required for the accompanying radscreen sample at each sample location. The radscreen sample will be taken immediately adjacent to the analytical sample. The individual weight of all samples will be determined using a calibration-certified scale and recorded. The samples will consist of square or rectangular sections with a surface area of a minimum of 100 cm<sup>2</sup>, and this surface area will be measured with a ruler or tape measure and recorded. These samples will be sent to an off site laboratory and analyzed for the five RFETS isotopes of concern (Pu-239/40, Am-241, U-233/234, U-235, and U-238) to ensure that no DOE

radioactive material is trapped beneath the heat reflective paint. The analytical laboratory Statement of Work will be modified such that the complete sample is tare weighed and digested, and that in addition to providing a concentration-based result (i.e., pCi/gm), the laboratory will be required to provide a total activity per isotope for the entire sample.

Pre-sampling and post-sampling radiological surveys will be required.

**NOTE:** T112C, which is also located in the vicinity of T112A and T112B, is the youngest of the three trailers and has a rubberized textile roof that is in good condition. Little or no alpha activity is anticipated. Its roof will not be sampled since previous survey activities exhibited activity less than DCGLs.

Samples will be collected using the sampling techniques described in CAS SOP-003, *Commodore Advanced Sciences, Waste Characterization Procedure*. Roofing material will be removed utilizing a utility knife or tin snips, as required by the material. A water spray mist will be used as necessary in order to prevent generation of dust, due to the (low) potential for asbestos in the roofing material. No asbestos characterization of the roof will be performed. Glass sample jars will be used to collect samples, and signed custody seals will be applied after sample collection. Quality control samples, such as rinsates, duplicates, and trip blanks, are not required for this effort.

## 4.0 SAMPLE DESIGNATION

Each sample will be assigned a unique number in accordance with the RFETS Analytical Services Division (ASD) requirements. The unique sample number will be broken down into the following three parts:

- Report Identification Number (RIN)
- Event Number
- The Bottle Number

The first part of the number will be the RIN, which is assigned by the ASD. The RIN is used by the ASD to track and file analytical data. It is expected that one RIN will be assigned, however, if the project is not completed quickly, ASD may assign additional RINs. The RIN will be a seven digit alphanumeric code starting with "99" for 1999. The RIN will be followed by a dash "-" and then the event number. The event number is a three digit code, starting with "001" under the RIN, and will be sequential. Each typical sample location will have a unique event number under the RIN. The event number will be followed by a period "." and then the sequential bottle number. The bottle number will be used to identify individual sample containers collected at the same location and same event number.

In addition to the sample numbering scheme above, additional information will be collected with respect to each sample. This additional information will include:

- Sample type
- Location code

## 5.0 SAMPLE HANDLING AND DOCUMENTATION

Sample custody will be maintained and documented using RFETS chain of custody forms. Sampling equipment (e.g., utility knife, tin snips) will be decontaminated between sampling locations. Decontamination will be performed using a spray rinse of distilled or deionized water followed by wiping with a Kimwipe™. The sampling tool will then be visually verified free of contamination, prior to its next use. Sampling information shall be documented on field log sheets or notebook. The originator shall authenticate (legibly sign and date) each completed hardcopy of the data. A peer reviewer, someone other than the originator, shall perform a review of the logsheet/notebook. The peer reviewer shall authenticate each hardcopy completed by the originator. Any modifications shall be lined-through, initialed, and dated by the reviewer (in ink). The QA Records for the project include the field log sheet and chain-of-custody forms.

## 6.0 PROJECT ORGANIZATION

Table 6-1 lists the responsible personnel assigned to this project, their responsibilities and contact information.

Table 6-1 Personnel Supporting the T112 A and T112B Roofing Characterization

Name	Responsibility	Phone	Pager	Radio
Paul Wojtaszek	Project Manager	3125	None	3723
Dave Barnes	Radiological Engineer	5352	212-6541	3759
Dave Farler	Industrial Hygiene	4340	212-6555	3734
Dan Lippencott William Santiago Michelle Hershey	Commodore Sample Team	5267	212-3129	3502
Greg DiGregorio	Quality Assurance	5688	212-6206	none
Marla Broussard	Characterization Manager	6007	212-6261	none
Stan Jablkowski	Radiological Control Technician	2397	none	none
Letty Cooper	Radiological Operations Supervisor	2397	212-2333	3208